Cross Reference of NPL: FRL 9-2-480

Adjusted Final NPL-US-2-4 8/90 1/30/89 C 3

National Priorities List

Superfund hazardous waste site listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended in 1986

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
Kalamazoo, Michigan

Conditions at listing (May 1989): The Allied Paper, Inc./Portage Creek/Kalamazoo River Site involves PCB contamination of an Allied Paper, Inc., property, in Kalamazoo, Kalamazoo County, Michigan, plus a 3-mile stretch of Portage Creek from Kalamazoo to where the creek meets the Kalamazoo River, and a 35-mile stretch of the Kalamazoo River.

Allied Paper, Inc., has operated paper mills on a 80-acre property at 2030 Portage Road in Kalamazoo since 1925. The company, a subsidiary of SCM Corp., recycled and deinked paper, including carbonless copy papers, which contained 3.4% by weight of Aroclor, a PCB, from 1957 to 1971.

In 1986, the Michigan Department of Natural Resources (MDNR) detected PCBs in several places in the 80-mile stretch of the Kalamazoo River between Kalamazoo and Lake Michigan. Contamination is primarily in the sediments, although the water column and fish are also contaminated. According to MDNR, the contamination begins at the point were Allied's Bryant Mill Pond discharges to Portage Creek.

MDNR tests conducted in October 1985 also found PCBs (Aroclor 1242 and 1254) in monitoring wells around a landfill on the Allied property, two seeps from a sludge disposal area, and a discharge to Portage Creek. An estimated 142,000 people obtain drinking water from public wells within 3 miles of the site, the nearest 1.1 miles from the site. No alternate unthreatened sources of water are now available.

In 1977, the Michigan Department of Public Health issued an advisory warning against eating fish in the river because they were contaminated with PCBs. In 1984, MDNR began a long-term project to clean up the river after it was listed in the Michigan Environmental Response Act. MDNR has conducted extensive sampling to determine the extent of contamination.

On December 2, 1987, the State filed a complaint under CERCLA Sections 107 and 113, the Resource Conservation and Recovery Act, the Federal Water Pollution Control Act, the Toxic Substances Control Act, and three Michigan laws. The complaint called for Allied Paper and SCM Corp. to stop the release of hazardous substances into the environment and pay cleanup costs. In response, the companies have undertaken studies of the extent of the PCB contamination, the quantities of PCBs in Bryant Mill Pond, and possible remedial actions.

Status (May 1990): MDNR is considering various alternatives for the site.

Facility name: Allied Paper - Portage Creek - Kalamazoo River

Location: City of Kalamazoo to Lake Allegan Dam, Michigan

EPA Region: V

Person(s) in charge of the facility: R. Richard Eaton, Manager
Allied Paper Inc.

Name of Reviewer: George Carpenter, Betty Michalski } MDNR Date: 1/30/89

General description of the facility:

(For example: landfill, surface impoundment, pile, container, types of hazardous substances, location of the facility, contamination route of major concern, types of information needed for rating, agency action, etc.)

Allied Paper has deinked and recycled paper in Kalamazoo since 1925. PCBs were used in printing inks during the 1950s and 1960s and in carbonless copy paper from 1957 to 1971. Carbonless copy paper was recycled by Allied and, until the early 1950s, process waste was discharged directly to Portage Creek. Allied installed wastewater treatment systems but, until the mid 1970s, visible process waste was entering the Creek. Low concentration discharges of PCBs have been detected in their waste stream. Significant PCB sediment loads have been detected in Portage Creek and the Kalamazoo River as far downstream as Lake Allegan. The release of PCBs from contaminated sediments throughout the contaminated area is a continuing source of contamination to Lake Michigan.

Scores: $S_M = 36.41$ $S_{gw} = 61.54$ $S_{sw} = 13.43$ $S_a = NA$

S_{FE} = NOT EVALUATED

S_{DC} = NOT EVALUATED

FIGURE 1
HRS COVER SHEET

Revised in response to comments John Miller 7/31/90

QA John Miller 3-27-89

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 (15) 18	1	15	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			16	26	
5 Targets					3.5
Ground Water Use	0 1 2 (3)	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 (40)	1	40	40	
Total Targets Score			49	49	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			35280	57.330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 61.54		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

QA
John Miller
3-27-89

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0	(45)	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.						
2 Route Characteristics						4.2
Facility Slope and Intervening Terrain	0 1 2 3		1		3	
1-yr. 24-hr. Rainfall	0 1 2 3		1		3	
Distance to Nearest Surface Water	0 1 2 3		2		6	
Physical State	0 1 2 3		1		3	
Total Route Characteristics Score					15	
3 Containment	0 1 2 3		1		3	4.3
4 Waste Characteristics						4.4
Toxicity/Persistence	0 3 6 9 12 (15) 18		1	15	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8		1	1	8	
Total Waste Characteristics Score				16	26	
5 Targets						4.5
Surface Water Use	0 1 (2) 3		3	6	9	
Distance to a Sensitive Environment	0 1 2 (3)		2	6	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40		1	0	40	
Total Targets Score				12	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				8640	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{SW} =	1343		

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

QA
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3-27-89

NOT SCORED

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
[1] Observed Release	0 45	1		45	5.1
Date and Location:					
Sampling Protocol:					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
Total Targets Score				39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a =			

FIGURE 9
AIR ROUTE WORK SHEET

QA
John K. Miller
3-27-89

	S	S^2
Groundwater Route Score (S_{gw})	61.54	3787.17
Surface Water Route Score (S_{sw})	13.43	180.36
Air Route Score (S_a)		—
$S_{gw}^2 + S_{sw}^2 + S_a^2$		3967.53
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		62.99
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$		36.41

FIGURE 10
WORKSHEET FOR COMPUTING S_M

QA
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3-27-89

NOT SCORED

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} =			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

QA
John Miller
3-27-89

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

PCBs - Arochlor 1242

Rationale for attributing the contaminants to the facility:

Please refer to page 2A

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern:

Please refer to page 2B

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

N/A

Depth from the ground surface to the lowest point of waste disposal/ storage:

N/A

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3-27-89

Rationale for attributing contaminants to the facility:

Monitor wells sampled by the Michigan Department of Natural Resources show the following results:

	Background wells		Contaminated wells	
	1	2	3	5
Arochlor 1242	ND[1]	ND[1]	0.520 [2]	0.490 [3]
Arochlor 1254	ND[1]	ND[1]	ND[4]	0.067 [3]

(concentrations expressed as parts per billion)

1 Detection limit 0.100 ppb (INT K.1)
2 Detection limit 0.010 ppb
3 Detection limit 0.050 ppb
4 Detection limit 0.200 ppb (INT K.2)

(Ref. 1)

Allied Paper Company was a major recycler of high quality papers (Ref. 15, p. 9) and a recognized authority in the deinking process (Ref. 15, p. 8). Recycling of NCR carbonless copy paper, which contained PCBs (Ref. 15, pp. 9 - 11), resulted in the discharge of Arochlor 1242 and Arochlor 1254 to the environment. Bryant Mill Pond has become contaminated with PCBs at concentrations as high as 1000 mg/kg (Ref. 6, Attachment 4, sample 12-2). Seeps from the onsite landfill also showed the presence of PCB at significant concentrations (Ref. 12, Appendix B, p. 188; Ref. 23). Logs of the monitor wells referenced above which were installed at Allied Paper can be found in Reference 4.

QA John K Miller 3-27-89

DESCRIPTION OF THE AQUIFER

The aquifer of concern is the Glacial Drift aquifer of the Kalamazoo, Michigan area. In the area surrounding Allied Paper, the glacial drift aquifer consists of unconsolidated morainal, outwash, or channel deposits. Morainal deposits are tills deposited directly from the overlying glaciers; water did not generally play a part in the depositional process. Outwash deposits were laid down from meltwater streams issuing from the glacial ice. Channel deposits are very similar to outwash deposits, except they have been eroded and reworked by streams and rivers, and are often covered with a layer of finer grained deposits (Ref. 3 pp. 25-27). The aquifers which are most capable of supplying significant quantities of water are in areas of outwash or channel deposits. Allied is located in an area of channel deposits which are approximately 100 to 200 feet thick (Ref. 3, pp. 26-28).

Aquifers in the Kalamazoo area are recharged by infiltration of rainfall, snowmelt, and surface waters induced by pumping near surface sources, although recharge from streams can be impeded locally by high sedimentation rates and siltation. (Ref. 3, p.1). Most of the well fields in Kalamazoo are adjacent to creeks which are tributary to the Kalamazoo River. The municipality has conducted a program of inducing recharge to some of the aquifers by the construction of recharge ponds and channels, and by streambed improvement. As an example, three ponds on Axtell Creek were created as recharge for the well field in that area (Ref. 3, p. 37, Fig. 15). This area is located approximately 1/2 mile to the northwest of Allied Paper. A similar program was initiated on the west fork of Portage Creek, just upstream of Bryant Mill Pond. A recharge channel was dredged and a portion of the flow diverted from the creek. Figure 9 of Reference 3 illustrates surface recharge to the water table aquifer and then to the producing zone through a layer of relatively lower permeability. Leakage through this layer is apparent from aquifer tests and comparisons of pumpage rates and flow volumes in Axtell Creek (Ref. 3, p. 38). The flow in Axtell Creek is diminished considerably during periods of high pumping rates in that area.

In addition, well logs from the area demonstrate the homogeneous nature of the unconsolidated sediments in the glacial drift aquifer. Log 2S 11W 27-1 (numbering refers to range, township, and section in which the well is located) shows sand and gravel to a depth of 191 feet beneath a three foot layer of surface muck (Ref. 3, p. 109). The log of well 2S 11W 22-94 indicates 211 feet of sand and gravel, with a one foot layer of clay (Ref. 3, p. 106). Thus, the absence of a confining layer and the demonstrated recharge of the aquifer from the surface indicates that the water table encountered by the monitor wells is in hydraulic connection with the municipal water supply, and that the observed release is occurring in the aquifer of concern.

QA John K Miller 3-27-89

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

N/A

Mean annual lake or seasonal evaporation (list months for seasonal):

N/A

Net precipitation (subtract the above figures):

N/A

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

N/A

Permeability associated with soil type:

N/A

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

N/A

* * *

QA
John K Miller
3-27-89

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

N/A

Method with highest score:

N/A

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

PCB (Arochlor 1242 and Arochlor 1254)

QA John K Miller 3-27-89

Compound with highest score:

PCB

HRS value = 15

(Ref. 5)

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

A waste quantity factor value of 1 is assigned on the basis of the demonstrated presence of an unknown quantity of hazardous substances.

Basis of estimating and/or computing waste quantity:

Estimates of the volume of PCB contaminated sediments present in the Bryant Mill Pond/Portage Creek/Kalamazoo River system have ranged from 275,972 cubic yards in Bryant Mill Pond contaminated at greater than 5 mg/kg (Ref. 6, p. 1), to approximately 114 tons (227,910 pounds) of PCBs throughout the entire system (Ref. 7, p. 1). However, these estimates are based upon assumptions regarding contaminant distribution in the sediment profiles which cannot be entirely substantiated by the available data. As a result, the waste quantity factor will be assigned a factor value of 1, representing the demonstrated presence of an unknown quantity of waste.

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Five municipalities along Portage Creek and the Kalamazoo River obtain drinking water from the glacial drift aquifer (Ref. 8; Ref. 26)). There is not an unthreatened alternate source available (Ref. 8, Ref. 9, Ref. 26).

HRS Score = 3

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Kalamazoo Municipal well #20 (Ref. 8).

Distance to above well or building:

Approximately 500 feet (Ref. 9; Ref. 26).

Note: all wells within 2000 feet of the site receive the same HRS score of 4. Kalamazoo Muncipal well #20 is approximately 500 feet from Bryant Mill Pond.

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

Five municipalities along Portage Creek and the Kalamazoo River obtain their drinking water from the glacial drift aquifer. Of the total municipal wells located within three miles of the river, ten are located less than 200 feet from the river (Ref. 8).

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Total population served by ground water within a 3-mile radius:

City of Parchment	2,617
City of Plainwell	4,502
City of Otsego	5,000
City of Allegan	4,500
Kalamazoo	65,000
Total	81,619

(Ref. 8; Ref. 26)

HRS Score = 40

QA John Keller 3-27-89

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

PCB's (Arochlor 1242 and Arochlor 1254)

Rationale for attributing the contaminants to the facility:

Please refer to pages 6A, 6B, 6C, and 6D.

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

N/A

Name/description of nearest downslope surface water:

N/A

Average slope of terrain between facility and above-cited surface water body in percent:

N/A

Is the facility located either totally or partially in surface water?

N/A

QA John K. Miller 3-27-89

Evidence of a direct release to surface water is presented in Reference 12, page 44, where a release of 69 ng/L total PCBs from the Allied wastewater treatment plant has been documented. Allied acknowledges that releases have occurred and that PCBs have been deposited in Bryant Mill Pond sediments (Ref. 11). Extensive sediment sampling has documented the PCB contamination of Bryant Mill Pond, Portage Creek, and Kalamazoo River through Lake Allegan (Ref. 12, Appendix B; Ref. 17; Ref. 24). This contamination, ranging up to 1000 ppm in Bryant Mill Pond (Ref. 17) significantly exceeds the background values for sediments upstream of Bryant Mill Pond in Monarch Pond (averaging less than 1 ppm, Ref. 12, Appendix B, page 188) and the value for sediments in Morrow Pond in the Kalamazoo River upstream of its confluence with Portage Creek (averaging less than 1 ppm, Ref. 14, Ref. 17). Water samples also show a consistent pattern, with no PCBs detected above Bryant Mill Pond in the water column (Ref. 28).

The discharge of PCBs from Bryant Mill Pond to Portage Creek has been determined, on average, to be approximately 140 ng/L (Ref. 12, Table 14, p. 60). This demonstrates that there must be a continuous release of PCBs from Bryant Mill Pond sediments because the PCB concentration in surface waters at the pond discharge to Portage Creek is greater than that in the Allied discharge (see above), and the level of PCBs in sediment upstream of Bryant Mill Pond are relatively insignificant (Ref. 12, p. 188).

Evidence that historical releases to surface waters have occurred is presented in Attachment 4 of Reference 6. These sediment core data from Bryant Mill Pond show that the contamination is not restricted to the near surface sediments but extends two to seven feet into the deeper sediments (Ref. 6; Ref. 24, Ref. 17, pp. 1-3).

Further evidence that the releases to Bryant Mill pond were from Allied come from sediment sampling in Portage Creek upstream of Bryant Mill Pond. Samples taken 6600 and 6900 feet upstream from Bryant Dam revealed 0.04 mg/kg of PCBs (Ref. 12, Appendix B, page 188), while levels in the pond are as high as 1000 mg/kg (Ref. 6, Attachment 4; Ref. 17). Therefore, PCB releases to surface waters must have occurred at Bryant Mill Pond. Erosion of PCB laden sediments has occurred and is estimated to constitute a major source of contamination to the Portage Creek system (Ref. 13, Ref. 17, p. 2).

As shown in Reference 14, sediment samples from Morrow Pond (a Kalamazoo River impoundment upstream of the confluence with Portage Creek) averaged less than 1 mg/kg (two of 33 samples contained 4.1 and 4.9 mg/kg). This isolates and identifies Bryant Mill Pond as a major source of PCBs to the Kalamazoo River system.

Substantial PCB contamination has been detected throughout the Portage Creek/Kalamazoo River system below Bryant Mill Pond. The sediment burden data are summarized in the attached table on page 6B. Data collected from

QA John K Miller 3-27-89

1982 through 1988 are combined to show a consistent distribution pattern of PCBs with high concentrations in Bryant Mill Pond sediments. While concentrations decrease in downstream areas, they are significant as far downstream as Lake Allegan. As in Bryant Mill Pond, downstream sediment core data (Ref. 12, pp. 51-52) show that the contamination is not restricted to the near surface sediments but extends six to eight feet in the sediment. This indicates that long-term release and deposition has occurred and that there has been ample time for resuspension and downstream transport of contaminated sediments.

Average PCB Concentrations (in mg/kg) Found in Surface Sediment Samples from 1982 through 1986, Reference 12, Table 11.

River Region[a]	Year 1982	1983	1984	1985	1986
		b			
1		191.4(9)	226.8(4)	183.0(6)	189.6 (15)
2	85.0(1)	12.6(4)			
3	36.2(4)		13.0(1)		
4	8.8(2)	19.9(5)			
5				16.5(2)	
6	27.0(1)				
7		28.9(7)			
8				5.0(2)	
9		16.6(5)			

a River Region 1 = Bryant Mill Pond
River Region 2 = Portage Creek
River Region 3 = Portage Creek to City of Plainwell
River Region 4 = Former Plainwell Impoundment
River Region 5 = Plainwell Dam to City of Otsego
River Region 6 = Former Otsego Dam Impoundment
River Region 7 = Otsego Dam to Trowbridge Dam (includes former Trowbridge Dam impoundment)
River Region 8 = Trowbridge Dam to City of Allegan Dam
River Region 9 = Lake Allegan

b average concentration based on (number of samples)

QA Johnson Miller 3-27-89

Allied Paper Co. was a major recycler of high quality papers (Ref. 15, p. 9), generally classified as ledger paper, which included carbonless copy paper, and was a leader in recycling waste paper (Ref. 11, p. 1) and a recognized authority in the deinking process (Ref. 15, pp. 8, 14). Another mill discharging to the Kalamazoo River did not deink its recycled wastepaper (Ref. 15, p. 16) while other mills claimed to have had difficulty in obtaining carbonless copy paper because Allied may have excluded them from the high grade paper market (Ref. 16), which included significant amounts of NCR paper. PCBs were used in NCR carbonless paper (Ref. 11, p. 1; Ref. 15, pp. 9 - 11) and as a result of the recycling and deinking processes undertaken at Allied, PCBs have contaminated the river system. Generally absent from Bryant Mill Pond, Portage Creek, and Kalamazoo River sediments are the higher arochlor species (such as arochlor 1260) typical of transformer or electrical applications (Ref. 12, pp. 182-186). The PCBs present in sediments from the site are dominated by Arochlor 1242 and, to a lesser extent, Arochlor 1254 (Ref. 12, pp. 182-186).

Further evidence that downstream contamination is coming from Allied and Bryant Mill Pond is provided by sediment characterization data (Ref. 17, p. 2). Bryant Mill Pond sediments containing PCBs were characterized as a grey, silty, clayey, sludge-like material and this same characterization was made for PCB bearing sediments in all the downstream impoundment areas. (Ref.17, p. 2).

There are other dischargers of PCBs to the Kalamazoo River system (Ref. 12, p.44; Ref. 21). However, with the exception of the City of Otsego waste water treatment plant (WWTP), PCB concentrations in these discharges are generally less than in the Allied discharge, based on the 9/6/85 sampling event. The water supply for several of these systems is the Kalamazoo River either by direct intake or wells near the River. It is therefore probable that the River is the source of some of the PCBs in their discharges. It is also probable that Allied is one of the PCB sources to the Kalamazoo WWTP because some process water is dicharged to the Kalamazoo sanitary sewer (Ref. 4, p. 2). The James River Corporation mill at Parchment appears to have been only a minor discharger to the River. Recent discharge data indicate that PCBs are no longer being discharged to the River and that monitoring well and soil or sludge data around the mill's landfill area show little or no PCB contamination (Ref. 19). Similarly, recent reviews of the Plainwell Paper Co. in Plainwell and the Rock-Ten Mill (Formerly Mead Otsego) in Otsego indicate that these facilities are not a source of PCBs to the river and would not require water quality-based effluent limits for PCB (Ref. 20).

revised in response to comments John Miller 7/31/89 QA - John Miller 32-89

In summary, Allied is the source of PCB contamination in Bryant Mill Pond. Resuspension and transport of sediments contaminated with PCB has resulted in the contamination of Portage Creek and the Kalamazoo River at least to the extent of Lake Allegan. Allied is suspected as the principal source of contamination of downstream sediments because of the high PCB concentrations present in Bryant Mill Pond, the pattern of contamination in downstream sediments, the lack of any other identified dischargers which could have contributed PCBs to the extent of Allied, the characterization of the downstream sediments which are similar to those found in Bryant Mill Pond, and the amount of business Allied Paper did in deinking and recycling carbonless copy paper, the main source of PCBs, relative to other mills in the area.

QA John Miller 3-27-89

Is the facility completely surrounded by areas of higher elevation?

N/A

1-Year 24-Hour Rainfall in Inches

N/A

Distance to Nearest Downslope Surface Water

N/A

Physical State of Waste

N/A

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

N/A

Method with highest score:

N/A

QA
John Miller
3-27-89

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

PCBs including Arochlor 1242 and Arochlor 1254

Compound with highest score:
PCB

HRS value = 15

(Ref 5)

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

A waste quantity factor value of 1 is assigned on the basis of the demonstrated presence of an unknown quantity of contaminants.

Basis of estimating and/or computing waste quantity:

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Recreational - fishing, boating
Industrial - cooling and production water

(Ref. 12, pp. 24-25)

HRS score = 2

QA
John K Miller
3-27-89

Is there tidal influence?

no

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:
Less than 100 feet. Numerous wetland areas exist along Portage Creek and the Kalamazoo River. Note especially the extensive marshes near Otsego and Trowbridge (Ref. 27). In addition, Koopman Marsh, which covers more than 640 acres, is located approximately 1000 feet downstream of the Lake Allegan dam (Ref. 27).

HRS Score = 3

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

There are no endangered species in the project area.

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

There are no surface water intakes for potable water supplies. However, several municipalities have located water wells near Portage Creek and the Kalamazoo River. As discussed in the Ground Water Route, these waters are considered to be in hydraulic connection with ground water supplies. The population thus served is not considered for this pathway, [redacted].

Although there are indications that the Kalamazoo River is used as a source of irrigation water for corn and soybean crops, the exact location of the intakes could not be verified, and as a result these targets are not included in the HRS score. (Ref. 25)

HRS score = 0

John Keller 3-27-89

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

N/A

Total population served:

N/A

Name/description of nearest of above water bodies:

N/A

Distance to above-cited intakes, measured in stream miles.

N/A

QA. John Miller 3-27-89

AIR ROUTE

ROUTE NOT SCORED

1 OBSERVED RELEASE

Contaminants detected:

Date and location of detection of contaminants

Methods used to detect the contaminants:

Rationale for attributing the contaminants to the site:

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Most incompatible pair of compounds:

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Toxicity

Most toxic compound:

Hazardous Waste Quantity

Total quantity of hazardous waste:

Basis of estimating and/or computing waste quantity:

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

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Distance to critical habitat of an endangered species, if 1 mile or less:

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

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FIRE AND EXPLOSION
ROUTE NOT SCORED

1 CONTAINMENT

Hazardous substances present:

Type of containment, if applicable:

* * *

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Ignitability

Compound used:

Reactivity

Most reactive compound:

Incompatibility

Most incompatible pair of compounds:

* * *

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Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Basis of estimating and/or computing waste quantity:

* * *

3 TARGETS

Distance to Nearest Population

Distance to Nearest Building

Distance to Sensitive Environment

Distance to wetlands:

Distance to critical habitat:

Land Use

Distance to commercial/industrial area, if 1 mile or less:

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Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

Population Within 2-Mile Radius

Buildings Within 2-Mile Radius

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DIRECT CONTACT

ROUTE NOT SCORED

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

* * *

2 ACCESSIBILITY

Describe type of barrier(s):

* * *

3 CONTAINMENT

Type of containment, if applicable:

* * *

4 WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Compound with highest score:

* * *

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5 TARGETS

Population within one-mile radius

Distance to critical habitat (of endangered species)

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HRS Documentation Log Sheet
Allied Paper - Portage Creek - Kalamazoo River
MID: To Be Assigned

Reference Number		Citation
1	✓	MDNR sample results plus location map of monitoring wells around Allied Paper's landfill, 7 pages. Report dated April 16, 1986.
2		Uncontrolled Hazard Waste Site Ranking System; A User's Manual. National Oil and Hazardous Substance Contingency Plan, Appendix A (40 CFR 300) (47FR 31219) July 16, 1982.
3	✓	Ground - Water Hydrology and Glacial Geology of the Kalamazoo Area, Michigan. Deutsch, Vanlier, and Giroux, 1960.
4	✓	Program for Effective Residuals Management for the Allied Paper, Inc. Solid Waste Disposal Facility. Wilkins and Wheaton Testing Lab., Inc. Feb. 1986
5	✓	Dangerous Properties of Industrial Materials. N. Irving Sax and Richard J. Lewis, Sr. - 7th edition. Van Nostrand Rheinhold, New York, 1989.
6	✓	Bryant Pond Volume Estimates for Sediment with PCB Concentrations Exceeding 5, 10, 25, 50, and 100 mg/kg. LTI - Limnotech, Inc. Memorandum Report to Jon F. DeWitt, September 2, 1988.
7	✓	Survey of PCBs in Kalamazoo River and Portage Creek sediments, Kalamazoo to Lake Allegan, November, 1983, prepared by Bill Creal, 10 pages.
8	✓	November 9, 1988 Call Log, Conversations with Rich Benzie and Don Griner, 1 page.
9	✓	January 26, 1989 Call Log, Conversation with Bruce Minsley and map of 1983 data from Table 3 in Surface Water Attribution Rationale.
10	✓	Table 2, Municipal water withdrawal, from Municipal Water Withdrawal in Michigan, 1982, MDNR Water Management Div.
11	✓	Affidavit of Tom Flanagan: State of Michigan et.al. V. Allied Paper, Inc. et.al.. 3/18/88.
12	✓	Kalamazoo River Remedial Action Plan, Second Draft, MDNR, December, 1987, 275 pages.
13	✓	Affidavit of Gregory W. Peterson: State of Michigan et.al. V. Allied Paper, Inc. et.al.. 3/18/88.
14	✓	Technical Memoranda Sampling for PCB Contamination

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Kalamazoo River: Morrow Lake, Comstock, Michigan. SZA-Donohue, September 9, 1988.

15 ✓ Deposition of Thomas E. Flanagan: State of Michigan et. al. v. Allied Paper, Inc. et. al. 4/20/88.

16 ✓ Allied Paper-Recycling, Rite-o-gram from Bill Creal to George Carpenter, 1/30/89.

17 ✓ Kalamazoo River Investigations, Memorandum from Jeff Anderson and Rick Veen, SZA-Donohue to Bill Creal, 1/25/89.

18 ** Deleted **

19 ✓ Final Results of PCB Study Plan, Letter from Elizabeth A. Howard, James River Corporation, to Linda Koivuniemi, 3/17/88.

20 ✓ Rock-Ten Mill, (Simpson) Plainwell Paper Co. PCBs, DNR Memorandum from Christine Waggoner to George Jackson, 1/23/89.

21 ✓ Point source sampling results and map of outfall locations.

22 Summary of MDNR extended sampling results.

23 ✓ Memorandum from William Creal, Water Quality Surveillance Section, to Fred Morley, Compliance Section #1, re: Slime Growths in Portage Creek, Kalamazoo. Oct. 17, 1985.

24 PCB concentrations in sediments. Kalamazoo River PCB Study. Prepared by NUS Corporation for the Michigan Department of Natural Resources. Feb. 1986.

25 ✓ Log of telephone conversations regarding use of the Kalamazoo River for irrigation of food and forage crops.

26 Availability of Water in Kalamazoo County, Southwestern Michigan. U.S. Department of the Interior and Gelogical Survey Water Supply Paper, 1973. Plate 8. see Ref 9 in other Pkg

27 U.S.G.S. 7 1/2 minute series topographic maps of the subject area.

28 Michigan Department of Natural Resources water sampling results for 4/18/85, 7/23/85, 10/16/85, and 6/17/85.

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